# FAA AVIATION NEWS

NOVEMBER 1971

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**COVER**

Experiment at Knoxville: Can collision avoidance be handled by ground-based radar tracking computers? See page 12

# FAA AVIATION NEWS

**DEPARTMENT OF TRANSPORTATION** / FEDERAL AVIATION ADMINISTRATION VOL. 10, NO. 7

**CONTENTS**/ November 1971

**3** Hot Starts and Cold Engines

**4** Take It Off—Fast

**6** No Fuel Like Your Own

**7** Personal Inspections: The Second Sunday

**8** VFR+VA=IFR

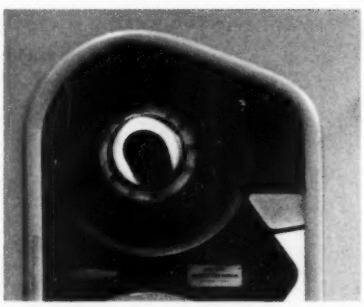
**10** Famous Flyers: Katherine Stinson, "The Flying Schoolgirl"

**12** Collision Avoidance from the Ground Up

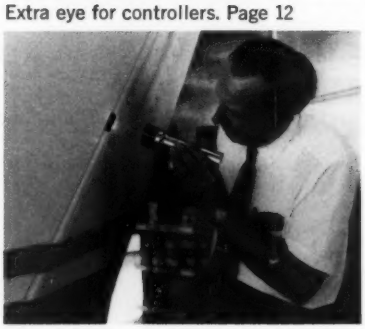
**13** Pilot Briefs

**14** News Log: Air Carrier Maintenance for Heavier GA Aircraft . . . 1971 Aviation Mechanics Safety Awards Competition Open . . . Tighter Noise Compliance for Jets . . . Guidelines for Radio Technician Training . . . Quick Test Sharpens DF Equipment

**15** Flight Forum



Extra eye for controllers. Page 12



A squeak in time. Page 7

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*FAA AVIATION NEWS is published by the Office of Public Affairs, PA-20, Federal Aviation Administration, Washington, D. C. 20591, in the interest of aviation safety and to acquaint readers with the policies and programs of the agency. The use of funds for printing FAA AVIATION NEWS was approved by the Director of the Office of Management and Budget, August 9, 1971. Single copies of FAA AVIATION NEWS may be purchased from the Superintendent of Documents for 20 cents each. All printed materials contained herein are advisory or informational in nature and should not be construed as having any regulatory effect. The FAA does not officially endorse any goods, services, materials, or products of manufacturers.*

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# Hot Starts and Cold Engines

Frosted plugs are a common cause of no-start on wintry mornings. Pre-heating saves delay.

No one has to live in Alaska to feel the effects of winter weather on flying. In any area of the country where the temperature drops below freezing during the night, extra preflight preparations and some changes in ordinary flying procedures may be needed to ward off mechanical mishaps brought on by Old Man Winter.

Perhaps the most common (and most ignored) occurrence that can take place in an airplane parked outdoors in a frosty night is the condensation of moisture in the closed cabin or within air ducts. Many a pilot has taken off on a beautiful crisp clear morning only to find himself abruptly socked in by a fog of his own making as moisture condensed on the *inside* of his windshield. Preflight procedures in winter should always include operating the cabin heater on the ground long enough to purge it of moist air.

The pilot's warm breath is also a source of moisture which can cloud up instrument panel glass, as well as the windshield, in cold damp weather. Since breathing is unavoidable, the best precautionary measure is to preheat the cabin before takeoff. Many airports have portable preheating devices and will, on suitable notice, have both the airplane engine and the cabin nicely warmed for you when you arrive on the scene. If you arrive in time to oversee the preheating operation, make sure that hot air blasts are not directed at flammable parts of the airplane, such as upholstery or fuel, oil or hydraulic lines. A charred airplane can upset your whole day's schedule.

**Cold and hot starts.** Engines will turn over somewhat sluggishly in wintry weather due to partially congealed oil, and consequently there is a tendency to overprime in order to hasten the start. This habit should be avoided, since it may result in an excess of raw gasoline washing the oil from the cylinder walls and leaving them vulnerable to scoring from the piston. In any case, it will make starting more difficult, by reducing compression. Excess fuel always increases the fire hazard; it is a good idea to have a fire guard standing by during cold starts.

Turbine engines give less trouble than piston types in cold weather, but it is recommended that ground power units be used wherever possible. Make the start with the aircraft facing into the wind, to avoid the possibility of a "hot start" (the firing of excess fuel in the burner cans or tail pipe before the fan reaches compression speed).

## Overpowering the Engine

**Takeoff.** Supercharged or turbine engines can be easily overboosted (and possibly damaged) in chilly weather if the pilot does not calculate the proper manifold pressure or engine pressure ratio for the pressure altitude and ambient temperature. Even with normally aspirated piston engines, there is a danger of harmfully exceeding the rated horsepower if subfreezing temperatures are ignored in handling the throttle. Power output increases at about 1 percent for each 10° of temperature below that of standard air (59°). At −40° F. an engine might develop as much as 10 percent more than the rated horsepower even though RPM and manifold pressure limits are not exceeded. The engine head temperature gauges should be carefully watched.

With many piston engines, the use of carburetor heat during takeoff in very cold weather may be desirable in order to assist the gasoline in vaporizing properly. Carburetor heat, under these circumstances, may also prevent an excessive leaning of the fuel/air mixture during takeoff, since the density of the air present increases directly as the ambient air temperature drops.

**Going up.** Oddly enough, one of the more common problems during climb-out in cold weather is the danger of overheating the engine—this applies, of course, only to engines with airflow systems modified for winter operations. When baffles are used to restrict the movement of cooling air, the engine is vulnerable to overheating at lowered airspeeds and high rpm. Here again, the head temperature gauges should be monitored, and at the first sign of trouble the cowl flaps, if pilot-controllable, should be opened. Otherwise reduce power or increase airspeed.

The opposite problem—keeping the engine warm enough for smooth operation—may be present during letdown and approach to land. Under reduced power, engine heat may not be sufficient to vaporize fuel fully and maintain the proper air ratio in the mixture. In this phase of flight the pilot has recourse to several procedures for increasing engine heat: he can use a higher power setting, without increasing airspeed, by extending gear or flaps at an early stage of the approach; or he can use carburetor heat.

At the end of a winter's day of flying, the pilot may want to alter his normal method of shutting down the engine by turning off the fuel and running the carburetor dry, instead of just leaning out the mixture. This will lessen the fire hazard the next morning, especially if the engine is preheated by an overzealous hand. ■

*A full discussion of this subject is available in "Cold Weather Operation of Aircraft," (FAA Advisory Circular 91-13A). Send a mailing label to DOT Distribution Unit TAD-484.3, Washington, D.C. 20591 when requesting your free copy.*

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# Take it Off... FAST

**Doctors who treat duster pilots warn against delays in removing clothing contaminated by pesticides. Seconds count.**

"Strip him down."

One sniff was all Dr. John O. Jones needed to tell him what the patient was suffering from, and one look was sufficient to tell him that speed was the essence of treatment if the man's life was to be saved. He recognized the young pilot as a crop duster named David Bufkin, a fellow resident of Kerman (Calif.). The latter was just coherent enough to disclose the fact that he had been spraying cotton nearby with Azodrin-5, an organic phosphate. In a freak accident, the hose on the pump of the spray mechanism had burst in flight, drenching the cockpit of his Stearman biplane and the pilot with the deadly pesticide.

While Bufkin was being stripped and scrubbed clean, Dr. Jones' mind raced back to the seminar for aviation medical examiners he had attended at FAA's Aeronautical Center at Oklahoma City in September 1970. It had not required a course in toxicology for him to know that organic phosphates are the most lethal of pesticides—a single drop of the pure chemical can be fatal.

What he *had* learned at Oklahoma City was that surprisingly heavy doses of antidote could be administered safely under controlled conditions. He checked his lecture notes from the course and then embarked on a treatment of atropine and protopam injected intravenously. Over an hour's span he injected two grams of protopam and 8 mgm of atropine—far more than he would have considered using under ordinary circumstances. The normal dose would have been about 1/20 of this amount. In view of the length of time Bufkin had been exposed to the Azodrin-5, and the impossibility of determining how much of the chemical he had absorbed, it did not appear possible to save his life except by an extraordinary procedure. Pilots who have been accidentally exposed to organic phosphate spills have died within much less than an hour.

Duster Bufkin was fortunate—he survived with no lasting ill effects. His survival was due, no doubt, to a number of factors, including his good luck in knowing where to find an aviation medical examiner like Dr. John O. Jones. But the major factor could have been the doctor's interest in the toxicology of aerial application, and his willingness to take four days of his valuable time to attend the FAA seminar given every month to bring aviation medical examiners up to date on the latest developments in aviation medicine.

As it happens, Dr. Jones is not only an A.M.E. but also a pilot with instrument and commercial ratings who is a designated counselor for the accident prevention program which was started in February 1971 in the Fresno GADO. He is concerned about all kinds of accidents, but living as he does just west of Fresno in the heart of California's San Joaquin Valley—one of the greatest agricultural producing areas of the world—he is especially attentive to aerial application flying and its hazards.

His favorite theme, in discussing accidents with duster pilots, is that their first act, following contamination with a pesticide, is to strip off all clothing from head to foot. The next step is to bathe—jump into the nearest body of water of any kind. The farmland near Fresno is cut through with a maze of irrigation ditches, and these will do as well as a bath tub—better, if time can be saved. Because of the lethal effects of even small amounts of organic phosphates absorbed

Above—Robert Asbury, FAA Accident prevention specialist from the Fresno GADO, inspects the broken hose of the spray plane with an interest toward preventing similar problems in the future. Below—Dr. Jones cautions a duster pilot about the danger of open cockpit exposure.

through the skin, seconds count in the race for survival.

Another major concern of Dr. Jones is getting all duster pilots to have a baseline check of their cholinesterese level taken at the beginning of every spraying season. Organic phosphates destroy life by lowering the level of cholinesterese (an enzyme required for normal function of the nervous system and for muscular movement including the muscles involved in breathing). If a physician has a record of the normal level of this enzyme for a particular individual, he can quickly determine the seriousness of any accidental exposure to a pesticide and treat it accordingly.

Spills or other accidents are not the only hazard in the business of aerial application. The cholinesterese level can drop gradually, due to careless, perhaps unconscious, habits of the duster pilot whose clothing becomes more contaminated than he realizes, and who does not scrub up adequately before eating. Wiping the sweat from one's brow with a contaminated sleeve, for example, will cause some absorption of the pesticide through the skin. Open cockpits are always apt to be exposed to a certain amount of dust or spray, and some of the makeshift canopies rigged to enclose cockpits have an unfortunate tendency to suck in spray-laden air. A face mask filter is much safer.

The danger of gradual poisoning is insidious because many of the warning signs—fatigue, blurred vision, headaches—may be ascribed by the unknowing pilot to the fact that during seasonal peaks he is working long hours day after day. Here again a simple check of his cholinesterese level will tell the difference between the effects of overwork and the symptoms of organic phosphate poisoning.

Baseline measurements are made without charge by field offices of the Food and Drug Administration. For the nearest location of an FDA laboratory write to: Toxicology Section, Pesticides Program, 1600 Clifton Road, N.E., Atlanta, Ga. 30333. Pilots may also apply directly to the Civil Aeromedical Institute (CAMI), FAA/DOT, P.O. Box 25082, Oklahoma City, Okla. 73125.

Dr. Jones regards crop dusting and spraying as one of the most difficult types of flying imaginable, since the conditions of flight are critical during virtually the entire operation. Pilots who take up this line of work evidently enjoy the constant challenge to their flying skill, but they should understand that the slightest impairment of judgment—which could result from gradual pesticide poisoning—could spell tragedy when most of their flying is done at vegetation-top level.

Dr. Jones, who was born in Pensacola, Fla., and earned his medical degree at Loma Linda, Calif., before coming to the Sacramento Valley in 1949, has been flying for eight years, accident free. He has a maxim which serves him well as a pilot, and which forms the basis of his piloting counsel to others: *If you have to be* somewhere at a fixed time *for very urgent reasons, don't fly yourself*. The urgency of the situation can easily cause a pilot's emotions to override his sound judgment, and press him into entering into flight conditions he cannot handle.

Dr. Jones also believes in disabusing pilots of the notion that flying is a means of relaxation. It may be a form of *recreation* but it is certainly not an opportunity to relax mentally: on the contrary, few activities, in his opinion, are as attention-demanding as flying an airplane. This is what makes the task challenging and interesting, but when the good doctor wants to relax his mind, he builds cabinets for his study or works outdoors among his 40 acres of cotton, alfalfa and vineyards. He would no more think of operating an airplane when he was under stress than he would think of operating on a patient under such conditions.

For some professional pilots, like those in aerial application, tension is admittedly a more or less continuous condition of work. The extraordinary proficiency of these pilots enables them to operate within an unusually narrow margin of error, where little or nothing is "forgiven." The large percentage of accidents per hour of flight in this category of flying could be reduced, Dr. Jones believes, if dusters realized just how narrow that margin is, and what the pilot can do to prevent it from becoming even more narrow. When handled with reasonable caution the aerial application of pesticides can and should be a safe procedure. L.D.G.

Agricultural flying is not the relaxing kind—you have to fly the plane every single minute, watching your drift so that it blows clear of your flight path but remains in the area.

Photo courtesy of Farm-Air, Inc. and McClatchy Newspapers.

In the aviation community the duster pilot falls into the class of fearless birdman—and to the young set he is a hero, reminiscent of the early days of daredevil flying. His is the toughest form of commercial flying.

# No Fuel Like Your Own

All that is labelled av gas is not necessarily piston-engine fuel. Why you do not want to find out the hard way.

When the helicopter pilot on forest fire patrol set down in Beech Meadow, in the Sierra Nevada Mountains of southern California near Kernville, he had only a routine refueling operation in mind. He had been flying hard. The heavily wooded mountains ranging over 10,000 feet were tinder dry on this hot August day. But the urgency of getting back into the air did not prevent him from noticing something unfamiliar about the odor of the fuel he was pumping from the drum cache into his Hiller 12E. *Funny smell for high octane . . . wonder what it looks like?*

Because he took the time to check the color of the fuel he was taking on, he lived to fly another day. What is more, his alert action, coupled with swift teamwork by FAA field offices, the U.S. Forestry Service, the Standard Oil Company and the Mexican Border Patrol, prevented a potential epidemic of light plane accidents due to engine failure. Highlights of the dramatic search and destroy mission:

*Tuesday, August 24: FAA Headquarters, Washington, D.C.*

**11:00 a.m.** Reports from the field indicate a possible fuel contamination problem in the Western Region. A pilot for Shasta Helicopters, Porterville, Calif., suspects that a cache of 55-gallon drums marked "AV GAS 100/130 OCTANE" may actually contain jet fuel (kerosene). FAA's General Aviation District Office at Fresno assigned the investigation.

**2:00 p.m.** Fresno GADO contacts supplier, Standard Oil, relaying code number markings on the drum in an effort to determine the source of the fuel. Meanwhile, a one-gallon sample is being flown to Fresno for lab analysis.

**3:00 p.m.** Standard Oil has determined that the suspected fuel was packaged at El Segundo, Calif., and has requested the El Segundo plant to investigate immediately.

**3:55 p.m.** Preliminary analysis indicates definite contamination. El Segundo reports coded numbers assigned to 189 barrels in a lot filled from one tank car; 16 are still in the warehouse, 173 were distributed to 19 known locations. A list of these places will be available shortly.

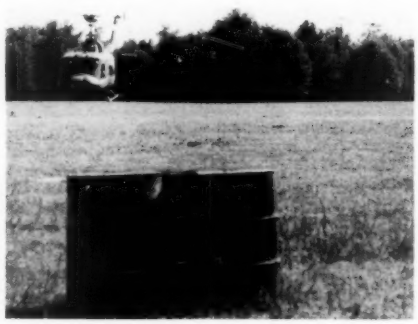
**4:00 p.m.** FAA's Western Region telephones all their GADO's requesting inspectors contact every known user of barrel fuel, including a number of aerial applicators (crop dusters), to check for drums with the involved code numbers. Operators will be asked to return all suspect barrels to Standard Oil at once.

**4:20 p.m.** FAA's Maintenance Analysis Center (MAC) at Oklahoma City is contacting adjoining regions where fuel could have been shipped to alert them to the danger. County fire departments are being notified; they cache fuel in the mountains. Some 80 aerial applicators have been notified.

*Wednesday, August 25*

**8:25 a.m.** Standard Oil advises FAA that 18 barrels of contaminated fuel have been returned; more is on the way. Further analysis of the blend of fuel in the drums indicate a mixture of kerosene and 100/300 octane, exact proportions not yet known. Such a mixture would result in a severely reduced octane rating, use of which might damage engines and could easily result in power failure.

In remote areas aviation gasoline is often transported and stored in drums. The Forest Service and ag plane operators also maintain caches of fuel in drums for ready accessibility. Occasionally a drum is mislabelled, or refilled inappropriately. Inspect what you use.



**9:30 a.m.** Standard Oil officials have identified the dealers who may have received fuel from the suspect batch, located in three states and Mexico.

*Thursday, August 26*

**4:30 p.m.** Standard Oil has now located and impounded 176 of the 189 suspect barrels of fuel. There are 13 drums still unaccounted for. These are believed to have been shipped to operators in Mexico.

*Friday, August 27*

**9:00 a.m.** FAA's El Paso GADO enlists aid of Mexico's Inspector of Airport in completing search for 13 missing barrels.

*Monday, August 30*

**9:00 a.m.** FAA Headquarters learns that 9 of the 13 drums of contaminated fuel that went to Mexico have been found and impounded.

**4:00 p.m.** Last four fuel drums are found in a warehouse in Mexico. The search is over.

In spite of all the elaborate precautions that are taken by manufacturers, aircraft fuel is occasionally mislabeled or contaminated. In many instances, an aircraft has had sufficient undiluted fuel in the carburetor to enable it to take off before the effects of contamination were experienced—frequently in a critical phase of flight.

In the incident cited in California, the practice at Standard Oil's El Segundo plant was to feed fuel from large tanks (containing kerosene, JP4, diesel oil and various blends of AV GAS) through valves into a manifold tank from which barrels were filled for various field use. Here human error could—and apparently did—result in an unintentional blending of gasoline and kerosene. To protect users, Standard Oil is now modifying packaging stations to provide an isolated filler valve and line for each grade of fuel.

But no system the human brain can devise will ever be 100 percent foolproof. Aircraft accidents stemming from the wrong fuel can be eliminated only if the pilot in command makes certain that he or a responsible member of his aircrew personally oversees the fueling process. Learn your colors, and respect them.

*Advisory circular 20-43 B, "Aircraft Fuel Control," is available from the DOT Distribution Unit, TAD 484.3, Washington, D.C. 20591. Send a mailing label for your free copy.*

The fuel colors of primary interest to general aviation pilots are green for 100/130 av gas, red for less than 100 octane, and white or colorless for jet fuel—or water. If in doubt about the latter, test with a hydrometer.

## Personal Inspections

# SECOND SUNDAY

**Have you ever taken a really good look at those slender wires on which you depend for controlling your aircraft?**

*(This is another in a series of articles on general aviation maintenance describing a non-technical pilot/owner's "personal" inspection schedule, which spotlights attention on a particular sector of the airplane. The previous article dealt with the engine.)*

In my book, flight controls are second only to the beast up front in matters of flight reliability, so I earmarked the second Sunday of my personal aircraft inspection schedule for the control systems. The importance of well-functioning controls is obvious, but malfunctioning controls are not always readily perceived by the pilot. He may attribute maneuvering difficulties to bad weather, poor design, or even lack of proficiency, whereas, in fact, the problem may be traceable to an aileron with restricted "travel," a bent trim tab, etc.

Control systems are classified as *Primary*—those necessary for safe flight, including ailerons, elevator and rudder; and *Secondary*—those offered for pilot convenience and ease, including flaps and trim.

In most light planes a maze of cables connects the cockpit controls to the movable control surfaces. This is accomplished by ingenious arrangements of pulleys, bellcranks, eyelets and channels running throughout the airframe of the airplane.

Earlier, as described in this series, I learned that airplane owner inspection is based on a simple "look and feel" procedure. This Sunday I added a third sense: *listening*. On an early Sunday morning the cockpit, with the engine sleeping and the door closed, can be a very quiet place: you can literally hear a pulley squeak. Very slowly and deliberately I worked each control while I listened and felt for any indication of binding, chafing or grittiness. I flipped the master switch "on" momentarily and ran the flaps down, then up, watching to see whether they extended and retracted symmetrically, in accordance with the window indicator. Finally I ran the trim full forward, then back, feeling and listening for trouble.

Next I got out of the plane and had my friendly helpmate operate each control while I observed outside whether the control surfaces were responding properly.

Then I sighted along the wing and tail to see if there were any signs of twisted or misshaped surfaces, which can result from flying in turbulence or conducting abnormal flight maneuvers. (Also from clumsy handling of the airplane on the ground.)

I felt the trim tab gingerly for excessive "free play." I had been surprised to read that the up and down motion should not exceed 2½ percent of the chord, measured at the trailing edge. Thus a tab with a 4" chord could have a maximum safe free play of *only 0.1 inch*. Trim tabs are constructed as lightly as possible to keep the weight aft of the hingeline low, and the buffeting airflow over the tab mechanism makes this part of the airplane highly susceptible to wear, deformation and fatigue failures.

The new lightweight materials in modern planes are more affected by small repairs—with even slight weight changes—than the older heavier materials. During cold weather, flutter or vibration can result from a collection of water or ice within an airframe part, so ventilation and drainage outlets should be carefully checked. Drain holes are normally found in the low spots, or trailing edges, of airplane parts.

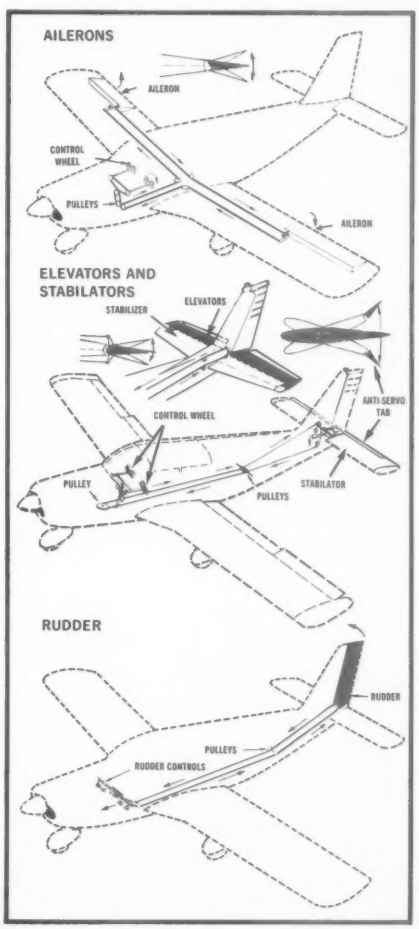
My final step in this three-phase inspection was to look around inside the inner belly of the airplane. I removed the panel at the rear of the baggage area and peered inside. I followed each cable with my flashlight, checking for any spot where it might rub against the fairleads (eyelets designed to route the cables). I was particularly concerned about fraying or rust on the cables, uncomfortably aware of what consequences this might lead to.

I had my helper work the rudders, trim and elevator again so that I could watch the cables operate and listen. I looked for any bright shiny spots that would indicate chafing—the rubbing together of two metal parts (cable and airframe, for example, or cable and cable).

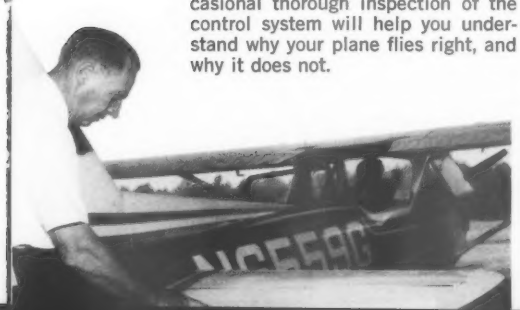
Back on the ground outside the airplane once more, I proceeded to remove all access panels that gave me another view of control cables, bellcranks or pulleys. The last panel, to my great satisfaction, disclosed a prize example of a badly rusted pulley bolt. So far as I could tell, it was not yet interfering with control action, but I located it on my inspection chart, which I would pass on to my mechanic, with a large red X.

When I had buttoned everything back together carefully, I performed my one last operation. I took my trusty oil can in hand and went around and oiled all control hinges, especially those which my ears had singled out as noisemakers. Then I listened as I moved them: the silence was golden!

Climbing out of the airport pattern that afternoon on my way to bore a few holes in the sky, I could not honestly claim that the airplane felt any more responsive. But *I* felt better, knowing that I was no longer a stranger to that mysterious network of slender wires to which my life was entrusted. ■




Between the cockpit controls and the movable surfaces of the wing, rudder and elevator (or stabilator in some planes) are numerous pulleys and literally yards of cable—right. An occasional thorough inspection of the control system will help you understand why your plane flies right, and why it does not.



The empennage, or tail, of the airplane is subject to considerable buffeting in flight, which can easily loosen nuts, bolts and screws. The balance of the trim assembly is so delicate that even a change brought about from uneven painting can disturb the stability.

# VFR + VA = IFR

**All across the land veterans are obtaining advanced airman ratings with valuable financial assistance from the new G.I. Bill of Rights.**

A dramatic upgrading of general aviation pilot proficiency is taking place all across the nation, thanks to the liberal provisions of the new G.I. Bill of Rights for ex-servicemen pilots. Over 72,000 have received advanced pilot training during the past five years.

Many of the pilots who completed their training have established careers for themselves in commercial aviation. But the largest number of them are businessmen or professionals from all walks of life who have been able to improve their flying skill by obtaining an IFR ticket, a multi-engine rating, jet rating, etc.

The training program has undoubtedly increased the safety factor in the skies because the general aviation fleet has now gained a large number of pilots who are able to handle more sophisticated aircraft in all kinds of weather.

Bob Burnside, 37, of Centerville, Va., is a typical example. Bob was an airman 1st Class in the Air Force from 1952 to 1956. He did not fly in the service, but after his separation he obtained a private pilot's license. Eventually he came to Washington, D.C., to work for the American Red Cross as Director of Water Safety; on occasions he found a private plane useful for quick business trips. In 1967, he enrolled in the VA advanced training program, eventually obtaining IFR and instructor's rating.

Very soon he had a chance to put his advanced training to good use. Nearing Little Rock, Ark. on what should have been a simple VFR flight from Columbia, Mo. in an Apache, things suddenly began to go wrong. Weather was deteriorating to IFR conditions, his directional gyro was erratic, and finally one of his radios failed. On the remaining good set he contacted Little Rock Tower and learned that the field was IFR, but thanks to his VA training he was able to advise the Tower that he was instrument rated and get an IFR clearance to land. As a VFR pilot he would have been forced to seek an alternate airport, or turn back toward Columbia, not a very pleasant prospect with radio problems and an unsteady gyro compass.

But it is not only the advantages of convenience which make Bob grateful for the VA program. The training taught him a lot he did not know about aerodynamics and the principles of heavier-than-air flight. As a result he considers himself a better, safer pilot, and is using his instructor's rating to pass his knowledge on to his students.

### How the Program Works

Last year alone there were over 32,000 former servicemen who obtained advanced training, and they join the ranks of all those ex-G.I.'s who received pilot training after World War II and the Korean War. However, there are some important differences in the new VA program, and if you are interested in it you should be aware of how the program operates and how you can be eligible for it:

1. **No Novices.** The new VA program, which is authorized under the *Veterans Readjustment Benefit Acts* of 1966, is available only for advanced training; and therefore you are eligible for it only if you possess a private pilot's license. You might remember that under the G.I. Bill following World War II you were eligible to receive basic pilot training, but the purpose of the new program is to provide *advanced* training only.

2. **Professional Objectives.** Under this program, the training you receive must either be directed toward some new career goal or toward some objective which will help you in your present job or profession. In the first category, for example, your purpose might be to qualify yourself as a commercial pilot, or a flight instructor, or a crop duster, or in any of the many positions in corporate and commercial flying. In the second category, you could use your advanced training to assist you in some way in your business occupation. Thus, a physician or a lawyer could obtain the training under the VA program if he uses a plane in his work. Similarly, a rancher or a salesman or practically any type of businessman could qualify if he flies a plane for some business purpose.

The Veterans Administration says that this new program is not for the "Sunday pilot," but recognizes that in our aviation age an increasing number of people will be flying private planes for business reasons, as many decades ago driving an automobile became an economic necessity. The appropriateness of each application is considered on its individual merits.

3. **Medical Requirement.** The veteran must possess, in addition to his pilot's certificate, a Class 2 medical license. He can then enroll in any number of advanced courses, including instrument rating, multi-engine rating, flight instructor, instrument flight instructor and commercial pilot. Some schools offer an approved course entitled "Fixed Wing Transition" which is especially designed for former helicopter pilots who are now learning to fly fixed wing aircraft.

4. **Service Eligibility.** Any veteran is eligible for the program if he has had a minimum of 181 days of continuous active military service, any part of which occurred after January 31, 1955. The former serviceman must also have been released from service under conditions other than dishonorable.

After returning from Viet Nam, Marine veteran Frank Statler earned his private pilot license on his own, but the VA program helped him get the additional ratings he needed to achieve his ambition: airline pilot. He went from fledgling to commercial pilot, with instrument and multi-engine ratings, in less than two years of hard flying and dedicated study.

5. **Cash payments.** The Veterans Administration will pay 90 percent of the flying school's established charges. (Under the program after the Korean conflict, the VA paid only 75 percent of the charges.) The former serviceman is entitled to one and one-half months of training for each month of active service; and if he had at least 18 months of service he is automatically entitled to the full maximum of 36 months of training. The VA pays $175 a month for each month of entitlement. This means that a person who is eligible for the full 36 months could receive a total of approximately $6,300 for his tuition and fees in advanced pilot training. These monies are paid directly to the veteran each month based on the flight instruction received and he, in turn, must reimburse the flying school.

6. **Choice of School.** You may take your advanced pilot training at any school which offers a course that has been approved by both the State Approving Agency and the FAA. This requirement of FAA approval guarantees that the flight school course must qualify under FAA's standards and it must continue to pass regular FAA inspections on the quality of its training, its equipment and its instructors.

The new Act further demands that no more than 85 percent of the students in a school at any one time may be receiving training under the VA program. Because of the nature of flight instruction, you may take your advanced training at any time that is convenient to both you and your instructors, even on weekends or early evenings. Servicemen who are still on active duty may also arrange to take the training under this program. Your local VA office will be able to inform you of what schools are approved in your area.

Frank Statler, 35, of Manassas, Va., is a case in point. Frank was a Marine captain who served in Viet Nam during his four-year hitch in the Corps. He had no military flying experience, but after he obtained his separation, he earned a private pilot's license. Then under VA sponsorship, he enrolled in an advanced training program which led him to a commercial license. Frank is now a pilot for Allegheny Airlines, flying regularly out of Washington National Airport. Without the VA program the cost of training for a commercial certificate would have left him grounded, despite his fervent love of flying.

VA advanced training does not, understandably, guarantee everyone a job in commercial aviation. In fact, the executive director of the National Pilots Association, Bill Ottley, says the job openings for commercial airline pilots are rather scarce at the moment, although he does predict an upswing in the future. Nevertheless, a grateful government does provide former G.I.'s with the necessary training and skills that improve their chances for a career of their own choosing.

Hayne Thompson, 30, of Alexandria, Va. is another VA assisted pilot. He served in the Air Force from 1963 to 1967 as an engineer with the rank of captain. Hayne learned to fly after leaving the service, and then took advanced training under the VA program. As financial manager for the Westinghouse Corporation he is able to use his new IFR rating on his business trips, but he is continuing his training, and hopes to have a flight instructor's rating soon so he can teach flying on the weekends.

A number of newly upgraded pilots are filling in as part-time CFI's (certified flight instructors), thus providing a valuable "feedback" to the training field, while ensuring pilot proficiency for the infrequent traveler. The heavy weekend and evening demand for instruction often exceeds the regular full-time staff supply of training schools.

There is no use trying to keep a good ex-serviceman (or woman) down on the ground when Uncle Sam is willing to help get him airborne. If you have been in the Armed Forces (or even if you are presently on active duty) and you think you could qualify, you can obtain assistance and further information about it from your nearest United States Veterans Assistance Center, VA regional office, local service officer, or veterans organization representative. They are listed in the telephone directory under U.S. Government, Veterans Administration. ■

## Veterans Administration Payment Plan

| TYPE OF PROGRAM | NUMBER OF DEPENDENTS AND RATE OF MONTHLY ALLOWANCE | | | |
|---|---|---|---|---|
| | None | One | Two | Each Additional Dependent |
| Institutional | | | | |
| Full time | $175 | $205 | $230 | $13 |
| Three Quarter time | 128 | 152 | 177 | 10 |
| Half time | 81 | 100 | 114 | 7 |
| Less than half time or while on active duty | Payments computed at the rate of the established charges for tuition and fees or at the rate of $175 per month for full-time courses whichever is the lesser. | | | |
| Cooperative training | 141 | 167 | 192 | 10 |
| Farm Cooperative | | | | |
| Full time | 141 | 165 | 190 | 10 |
| Three Quarter time | 101 | 119 | 138 | 7 |
| Half time (Less than half-time not permitted). | 67 | 79 | 92 | 4 |

| TYPE OF PROGRAM | NUMBER OF DEPENDENTS AND RATE OF MONTHLY ALLOWANCE | | | |
|---|---|---|---|---|
| | None | One | Two | Each Additional Dependent |
| Apprenticeship or On-Job Training (Full Time Only) | | | | |
| First 6 months | $108 | $120 | $133 | 0 |
| Second 6 months | 81 | 92 | 105 | 0 |
| Third 6 months | 54 | 66 | 79 | 0 |
| Fourth and any succeeding 6 month periods. | 27 | 39 | 52 | 0 |
| Correspondence | Established charges for course, allowance paid quarterly on pro rata basis for lessons completed by the veteran and serviced by the school. | | | |
| Flight Training *(NOTE: Entitlement reduced by 1 month for each $175 paid by VA while pursuing a program of flight training or correspondence.)* | 90 percent of the established charges for tuition and fees, allowance paid monthly on basis of number of actual flight instructional hours received and cost thereof. | | | |

Famous
**FLYERS**

*A determined pre-WW I feminist who knocked her male competition for a loop*

# Katherine Stinson, *"The Flying Schoolgirl"*

Shortly after seven o'clock on the morning of December 11, 1917, Katherine Stinson taxied her Curtiss Special biplane down the dirt runway at the North Island airport in San Diego. Her plane was heavy with its fuel load of 76 gallons, and the machine moved slowly at first, then picked up speed until gradually the wheels lifted off the ground and it became airborne. In the gray and somewhat chilly sky she eased the plane through a slow turn and headed north. Her flight plan was non-stop to San Francisco, a feat never before accomplished by airplane.

The odyssey which led to Katherine Stinson's bid for fame in the California skies began in Fort Payne, Alabama, where she was born in 1891. She was the eldest of four children, all of whom were to gain aviation renown as the famous flying Stinsons, but she was the first to fly and she provided inspiration for her brothers and sister. Katherine apparently owed her courage to her remarkable mother, Emma Stinson, who instilled in her first-born a reasoned approach to dangerous situations. In an interview during her years of fame, Katherine stated: "My mother never warned me not to do this or that for fear of being hurt. Of course I got hurt, but I was never afraid. If I think my machine is all right and I know I can manage it, I am not afraid."

When the family moved to Jackson, Miss., Katherine learned to drive an automobile at the age of 15, bumping along the back roads in an ancient flivver. Her initial career ambition was to become a pianist, and after years of practice on the family piano she was considered ready for additional training in Europe. However, the meager family purse was far from ready for this undertaking.

Katherine had observed in the newspapers the fantastic amounts of prize money early barnstorming pilots were making at fairs and exhibitions, sometimes as much as a thousand dollars a day, and she thought that perhaps she could finance her artistic education by learning to fly. She made a balloon ascent while visiting friends in Kansas City in 1911, and having satisfied herself that she was unafraid of the sky, she went to Chicago and became a student of the legendary Max Lillie, who instructed so many early pilots.

At first Lillie doubted the ability of the small girl to handle the cumbersome controls of those early Wright B biplanes, but she demonstrated an astonishing calmness and dexterity. After only four hours of instruction she soloed, and on July 19, 1912, she received her license from the Aero Club of America, performing the required figure-eights and an altitude "test" to 500 feet. She was only the fourth licensed woman pilot in America, following Harriet Quimby and Julia Clark (both killed in crashes within the previous month) and Matilda Moissant.

### Barnstorming the Circuit

She then embarked on a series of flying exhibitions around the country, which soon brought her into national prominence. Her small stature and her youthful appearance made her seem younger than she actually was, and she was billed as "The Flying Schoolgirl." However, what enthralled the large crowds which assembled to see her was her expertise with the Wright B, that primitive open aircraft constructed of spruce and wire and muslin-covered wings. The pilot was perched precariously on a narrow rigging fitted to the leading edge of the lower wing, but Katherine flew the plane gracefully and with firm control, and she was able to execute a wide variety of patterns which invariably culminated in a soft, perfect landing. At a state fair in Helena, Montana, in late 1913, she was authorized to fly the mail, and thus became the first American woman to do so.

The thrill and challenge of flying had captured her fully, and she now abandoned her earlier musical ambitions to devote herself entirely to aviation. In 1915 she was able to obtain an 80 hp Gnome rotary engine from a crashed plane in which the flyer had been killed, and she had the Partridge and Keller Aeroplane Company insert it in a new "looping" tractor biplane they were constructing for her. Looping at that time was particularly dangerous because the underpowered engines frequently stalled on the high point of the ascent, but Katherine performed the maneuver flawlessly over Grant Park, Chicago, on July 18, 1915, becoming the first woman in the world to loop-the-loop.

Katherine was also becoming a determined feminist of the airlanes, claiming that she could perform any maneuver a man could do. In an interview with the press in Los Angeles that same year she stated, "When I looped the loop in Chicago last July, it was a bitter pill for the male loopers to swallow, but I accomplished all their stunts and in my case went them one better." Her statement referred to her maneuver of a snap roll on top of a loop. In that same year pilot Art Smith had started to do night sky writing with a magnesium flare attached to his plane, and Katherine decided she had to emulate that. On December 17, 1915, before a large crowd of newspapermen in Los Angeles, she traced the abbreviation for California in the night sky. *Aerial Age Weekly*, noting the event, commented dryly that she performed it "to eclipse the feats of her male competitors."

Her reputation began to spread abroad, and in 1916 she made an extended tour of Canada, which was followed by an invitation to perform in Japan and China, another female first. During a six months' tour she attracted extraordinary crowds, particularly in Japan where 25,000 people gathered at the Yokohama parade grounds to watch her trace her initials in the sky with a magnesium flare. Numerous fan clubs were started in her honor by Japanese women

The "flying schoolgirl," looking like a perennial teenager, was a popular attraction at Camp Kearny, Calif.

Katherine's maneuvers in the Wright B were gracefully controlled although the pilot's seat in the awkward plane was no more than a precarious perch at the leading edge of the lower wing.

The record-setting "Junkshop Hybrid," built to Katherine's order by Curtiss, was a conglomerate of pieces salvaged from other airplanes.

who regarded her as a kind of liberator for their sex.

But these accomplishments were all a preamble to her great objective in 1917: a distance *and* duration record-setting flight from San Diego to San Francisco—designed as a massive blow to the myth of male superiority in the air. In 1917, Katherine was an attractive young woman of 26, with fine features and long, curly dark hair. She was frail and delicate in appearance, only slightly over five feet in height and 100 pounds in weight, but she had already amassed an impressive number of flying records, assuring herself an important place in the early history of American aviation. The flight to San Francisco, however, would be the crowning achievement of her career, and she had been making plans for it over several years.

### Hybrid Airplane

A few months earlier the Curtiss Company had delivered a machine built to her specifications under the direction of the firm's chief engineer, Henry Kleckler. The mechanics had nicknamed it the "Junkshop Hybrid" because it was constructed of salvaged parts from a number of different models—the fuselage and the tail came from an S-3 triplane, the wings were clipped down from an army *Jenny* and the engine was a 90 hp Curtiss OX-2.

The plane had the usual open cockpit of that era, and the two wings were connected by a bushy criss-cross of wires. The maximum air speed was 85 mph, the maximum range, 700 miles. As one concession to her sex, Katherine had ordered that a built-in vanity be inserted in the cockpit so she could arrange her makeup before meeting the press upon her arrival.

As Katherine left the San Diego area she was joined in the air by an Army JN-4 from Camp Kearny where she had put on an air show the preceding week. Katherine had always been popular with the military, and the base commander had assigned the escort plane as a mark of appreciation and encouragement. The *Jenny* flew alongside for the first 35 miles of the flight, and then at Oceanside it rocked its wings in salute and turned back toward the base. The OX-2 engine droned on, and Katherine was now alone in the gray sky.

She completed the first leg of the journey to Los Angeles with relative ease, but after she passed the city she began to nose her Curtiss biplane higher as she crossed a corner of the Mohave Desert and climbed toward the Tehachapi Mountains, that jagged range which extends across the center of California and rises in some places to a height of almost 8,000 feet. There was a stiff wind and the Curtiss wallowed somewhat, but evenually she nudged it to a height of 9,000 feet, the highest she had ever flown. Finally the mountains receded and the San Joaquin Valley lay below. The most dangerous portion of her trip was behind her, and her only problem now was gas consumption; she had used more fuel over the mountain area than she had originally anticipated.

The OX-2 engine continued to hum perfectly, without missing a beat. At two o'clock in the afternoon Katherine was sighted just south of Madera. Finally at four o'clock she passed the San Jose Mission, and 40 minutes later she began her descent at the Presidio parade grounds in San Francisco.

A large crowd of people ringed the field, held back by a company of soldiers, and as the wheels of the Curtiss touched the ground a great many boats in the harbor started to sound their horns and whistles. When the propeller stopped, Katherine checked her fuel gauge again; she had only two gallons left. The trip of 610 miles had taken 9 hours and 10 minutes, establishing a new American record for both distance and duration.

Despite the acclaim that followed her record flight, Katherine still chafed at restrictions applied to women. She sought enlistment in the armed services in the combat areas of World War I, into which the United States had now been drawn, even only as a reconnaissance pilot, but she was firmly rejected. Instead she began a series of fund-raising flights for the American Red Cross, the most notable of which was a multi-stop flight from Rochester, N.Y., to Washington, D.C., where she was able to present to the Secretary of the Treasury William G. McAdoo some $2 million she had collected in pledges enroute.

She was now regularly licensed to fly the U.S. mail, and in May of 1918 she attempted a mail flight from Chicago to New York. This time her Curtiss did run out of fuel at Binghamton, N.Y., and she was forced to make an emergency landing on a hillside. However, she had been in the air for 10 hours and 10 minutes, and the Aero Club awarded her the new duration record.

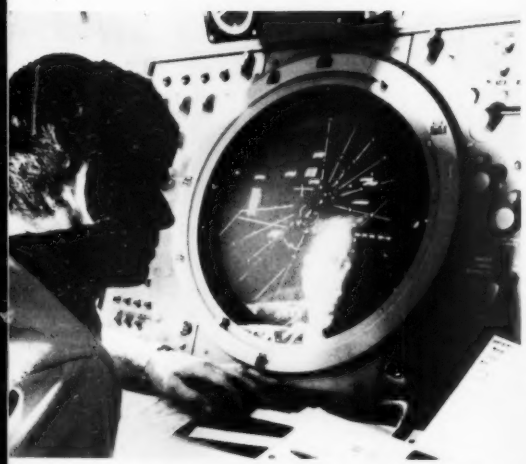
Still dissatisfied with a non-combatant role, she sailed for England where she did some more flying for the Red Cross and again attempted to join the military. But again she was rejected, and ultimately she went to France on her own as a volunteer ambulance driver for the Red Cross.

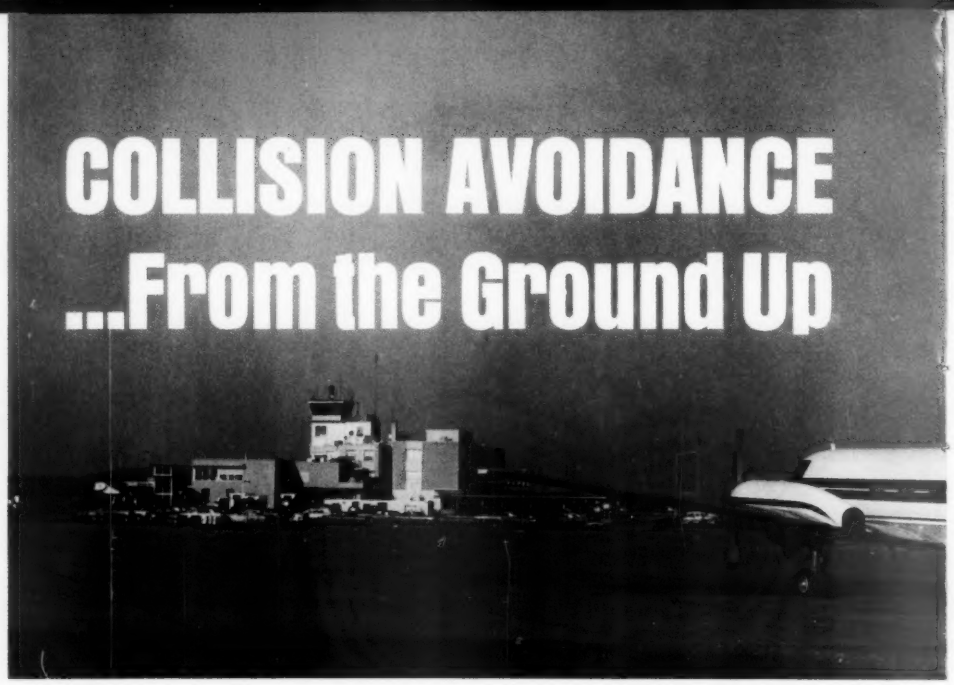
When she returned from Europe at the end of the war she discovered she had contracted influenza and, furthermore, the rigors of many hours in the air in the open cockpit had started to take their toll on her frail body. She recovered from the influenza but then she had to wage a six-year struggle with tuberculosis.

Katherine was forced to retire from active flying in 1920. She settled and has remained in Santa Fe, New Mexico, where she later married Michael A. Otero, an attorney and a former airman from W.W. I. She has been in poor health.

Katherine Stinson is a woman who showed unusual courage and ability in the early epoch of flying when both qualities were in great demand. She once said, "Fear as I understand it, is simply due to a lack of confidence or to a lack of knowledge—which is actually the same thing." ■

# COLLISION AVOIDANCE ...From the Ground Up





In the Knoxville, Tenn. tower engineers are testing techniques of alerting controllers to potential conflicts by means of signals flashed on the scope by a tracking computer.

*(Editor's note: Two previous articles in this series discussed several collision avoidance systems now under development or evaluation, which require new concepts in airborne electronic hardware. Today's article describes an experimental ground-based system, now undergoing evaluation at Knoxville, Tenn., which might be used at FAA control towers and centers for automatic tracking and prediction of conflicts.)*

FAA's air traffic control system has progressed to the point where automated radar tracking systems (ARTS III) will soon be operating at all major terminals. Constant improvement of the system is envisioned to the point where (about 1980) it may be possible to communicate automatically with selected aircraft by means of an advanced radar system.

To bridge over the period between the present and the time when such refinements as a Discrete Addressible Beacon System might be available, the agency is looking at new concepts of automated tracking and conflict detection which could point the way to extended protection, with little or no additional electronic gear carried on board the aircraft.

One such example is Goodyear Aerospace's associative array processor. For the past six months controllers, engineers and research experts have been considering the advantages of tracking aircraft with an associative or parallel type of computer, in contrast to the conventional "serial" type of computer.

Goodyear has described their system as being figuratively akin to locating a person in a theater audience by having his name called over a loudspeaker, as contrasted to having an usher locate him by identifying one person after another in the theater enclosure. Considerable time is saved, as the processor can perform multiple functions in millionths of a second.

At Knoxville the processor receives a constant flow of data regarding controlled air traffic movements (based on radar tracking and on data received from ARTS computers). Whenever a potential conflict is sensed it will cause one of three type of displays to appear on the controller's scope:

1. **Both aircraft involved are IFR.** Whenever their horizontal separation is predicted to fall below three miles and their vertical separation is less than 500 feet, an "alert" bar will blink on the scope over the targets, alerting the controller.

2. **One aircraft is IFR and the other is not, with altitude separation unknown.** Whenever their horizontal separation gradually decreases to less than one mile, and their altitude is not known, a lighted vector line on the scope will point to the area of potential conflict.

**3. One aircraft is IFR and the other is not, with altitudes known.** Whenever horizontal separation is predicted to become less than one mile and vertical separation is known (indicating a potential conflict), all alphanumeric data will be automatically erased from the scope except that pertaining to the aircraft requiring immediate vectoring. (These techniques are experimental and will be modified as experience is gained.)

This conflict prediction approach is regarded not so much as a separate collision avoidance system as an adjunct to the present means of controlling air traffic. It further reduces the possibility of mid-air collisions by having many of the controller's time-consuming arithmetical chores handled by a computer, and by drawing the controller's attention to potential conflicts in need of resolution well before the danger point is reached.

The concept of automated VFR radar advisories, which FAA may also be looking at in Knoxville early next year, could eventually make radar advisory service available to all VFR pilots at all times, near terminals or enroute, without impinging on controller workload or the basic function of separating IFR traffic.

To receive this service, in the initial testing at Knoxville a VFR aircraft would need to be equipped with a 4096 code transponder. The pilot requesting the service would be assigned a discrete code; thereafter his target and all others of interest to him would be tracked and possible conflicts reported to him via a computer-generated voice on a standard ATC frequency. The need for a transponder could be eliminated, upon successful completion of a current FAA test program to develop primary radar tracking capability.

Where the intruder is not transponder-equipped, information may presently be limited to relative bearing and range. Here again, successful development of tracking on primary radar targets could help by making heading and velocity information also available. The latter data, derived from range and range-rate, would help indicate closing rates, as well as the class of aircraft to look for, in many instances.

Where the intruder is transponder-equipped, much more detailed information could be provided by the automatic advisory service, such as the possibility of co-altitude, based on the beacon code assignment. Evasive action, if required, would be determined by the pilot. The advisory messages would be issued at five, three and one mile ranges from the requesting aircraft. When separation is determined to be increasing, a "clear of traffic" advisory would be issued.

Since the Goodyear processor in this experimental system is tied into the prototype ARTS computer of the ground facility, it is sensing the traffic flow of the entire system.

The goal is to achieve local conflict prediction with a minimum number of false alarms. It has the potential of providing increased safety to aircraft not equipped with any form of collision avoidance system or pilot warning indicator.

Early next year another potential feature of this system, terrain avoidance, may be examined. The system could be programmed to be thoroughly familiar with the exact contours of the mountainous terrain around Knoxville, which lies just west of the Great Smoky Mountains. Aircraft with mode C capability (altitude reporting transponders) could receive automatic warnings from the ground before venturing within hazardous range of any land form. Aircraft without this equipment could be assigned a specific altitude, acceptable to the computer, for a given segment of flight.

The use of ground-based radar tracking computers, such as the Goodyear processor, is one of several approaches to collision avoidance under study by FAA. In this particular concept, the cost of acquiring additional black boxes would be small or nil, and limited to some form of transponder at most. Some form of pilot instruction or direction might be necessary to insure that the desired enhanced protection was afforded all users of the airspace.

Other approaches discussed earlier in this series of three articles included the use of airborne radar signalling (Honeywell and RCA, October) and one-way, air-to-air, radio ranging (the "time-frequency" or ATA CAS, September). All of these latter "cooperating" concepts would require airborne equipment compatible with the system. ■

Computer teamwork makes Knoxville's conflict-detection system unique. The Goodyear associative-array-processor, below, works parallel to the Univac 1230, standard computer for FAA automated radar tracking systems.

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## Pilot BRIEFS

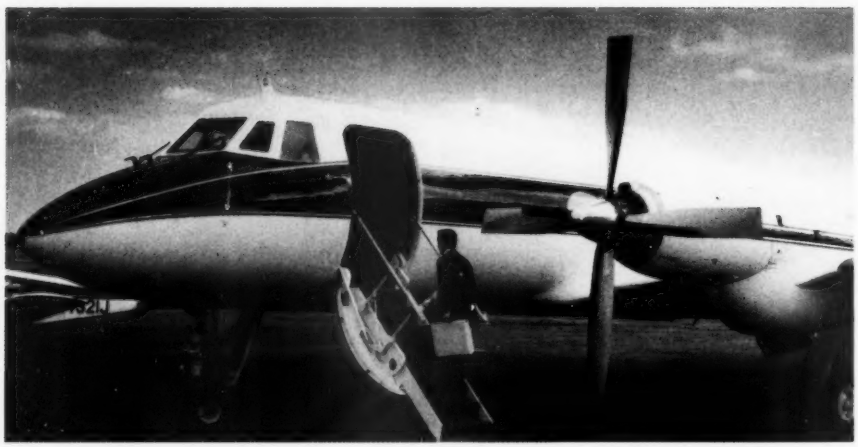
■ VFR USE OF NAVAIDS may be considered in making decisions on whether to decommission VORs. FAA is preparing to publish guidelines using the number of VFR radio contacts with flight service stations as the basis of criteria for keeping a VOR in use if it is no longer essential to the IFR airway network. It is estimated that of the pilots using VORs, one in seven communicates with the station. A minimum of 6,000 voice contacts per station annually (indicating navigational use by up to 42,000 VFR flyers) would be considered justification for keeping the facility in existence if this criteria is adopted. An average of less than one VOR has been decommissioned in each of the last ten years, while many have been added to the system.

■ EAST COAST PILOTS are advised of a new TV tower scheduled for completion this month in Camden County, N.J. sited on the 035° radial, 13 nautical miles from Millville VORTAC (115.2 MHz, Channel 99). The Channel 23 TV tower will extend 960 feet above ground level, and will have the new white strobe lighting system (in addition to conventional red obstruction lights). Another TV tower in Trenton, N.J. will also be converted to the strobe lighting system soon.

■ RNAV AT WORK is the theme of a symposium on area Navigation to be held January 24 and 25, 1972, at the Washington Hilton Hotel in Washington, D.C. Those planning to attend should send name, address, title and organization to FAA by December 1, 1971. Companies interested in setting up exhibits should contact FAA as soon as possible. Write FAA, 800 Independence Avenue, S.W., Washington, D.C., 20591. Telephone (202) 426-8241.

■ SEE-THROUGH. Two X-ray devices for detecting weapons and explosives in carry-on luggage were successful in recent FAA tests at Dulles Airport. The gadgets were able to detect and identify in unopened hand luggage "planted" items such as an electric iron, scuba diving pressure gauges, quantities of movie film, hand grenades, homemade bombs, knives, guns and explosives. The X-ray units, which emit extremely low radiation harmless to film, recording tape or individuals, creates a shadowgraph on a television screen. Screening for each individual usually took less than 10 seconds. Further tests are in process.

■ MARK THE SPOT. FAA's airmarking program has been transferred to the Office of General Aviation from the Facility Installation Service. FAA coordinates airmarking projects by pilot and state aviation groups, offering guidance and distributing surplus material for airport identification signs. Comments on the program are encouraged and interested persons should write FAA, GA-200, 800 Independence Ave., S.W., Washington, D.C. 20591.



# Air Carrier Criteria Proposed for Heavier GA Aircraft

General aviation operators of turbine-powered multi-engine airplanes and all aircraft over 12,500 lbs. would have to meet many of the safety requirements specified for the airlines under an FAA Notice of Proposed Rule Making. The new rule would affect corporate and individual operators, as well as flights carrying athletic teams, sport groups, choral societies and similar groups (when there is no charge made for the transportation); company employees or guests on company business; property or materials by manufacturers for delivery or processing; and flight demonstrations to prospective customers.

The proposal would add a new "Subpart D" to Part 91 of the FARs which would require the affected operators to have their aircraft maintained under air carrier criteria.

It would also prescribe operating rules which would include: IFR equipment for "over the top" and night VFR operations; survival and radio equipment for extended overwater flights; 1,000 feet minimum altitude for VFR flight; IFR altitude for night operations; 45 minutes fuel reserve for VFR flights; icing equipment and limits on flights in icing conditions; flight attendants for 20 or more passengers; passenger briefing; a flight engineer and a second-in-command pilot on certain airplanes; and an airplane inspection program (chosen by the operator) of sufficient scope to assure the continuing airworthiness of the airplane.

Comments on this proposed rule change (Docket 11437, Notice 71-32) should be submitted by January 5, 1972, to FAA, GC-24, 800 Independence Ave., S.W., Washington, D.C. 20591.

# Entries Due for 1971 Aviation Mechanics Safety Awards

Recognition in the form of awards, cash, advanced training, and a membership in the exclusive Aviation Mechanic Club awaits the winners of the 1971 Aviation Mechanic Safety Awards Program. The Club was formed in 1963 and is made up of regional and national winners of the annual competition. The Awards program is sponsored jointly by FAA and the Flight Safety Foundation, and supported by many segments of the aviation industry. State and regional winners are chosen from among mechanics in general aviation and in air carrier maintenance, with a national winner in each category.

Nominees for the awards must have improved the safety of plane or engine performance, suggested safer maintenance or inspection procedures or demonstrated a consistently high level of work. Previous winners have developed new testing methods, identified weak components prior to failure, and developed "behavior charts" on the engines in a fleet of aircraft, among other accomplishments.

Information and entry forms are included in Advisory Circular AC 60-2H, available at any FAA Field Office. Closing date for entries for the 1971 competition is December 31, 1971.

## Tighter Noise Compliance for Jets

A major change to FAR Part 36 which would set up more stringent conditions for noise certification of aircraft is under consideration by FAA. The new provision, affecting manufacture of transport and turbojet airplanes, would require compliance with noise levels in Appendix C of FAR Part 36 for all landing and takeoff altitudes and temperatures for which an airplane is type certificated. The proposal also affects modification of existing jets with regard to noise.

The present rule, adopted December 1, 1969, only requires compliance when the aircraft is flown from a sea level airport at 77 degrees.

## Guidelines Offered for Aviation Radio Technician Training Schools

Guidelines for setting up a course for aviation radio technicians in trade schools and colleges are offered in a new Advisory Circular published by FAA. Trained aircraft radio technicians are expected to be much in demand within a few years, and although there are numerous trade schools offering electronics courses, most of these emphasize television and industrial electronics rather than aircraft radio maintenance.

An FAA suggested course would include 2,000 to 2,200 hours of classroom and laboratory work, spread over a period of from 56 to 72 weeks. Subjects would be divided into three sections: Electronic Fundamentals; Aircraft Systems; and Regulatory Requirements. No FAA certificates would be awarded to the school or the graduates. (Individual technicians are not licensed by FAA but aircraft radio repair may only be done at an FAA Certificated Radio Repair Station, which must qualify both in equipment and personnel.)

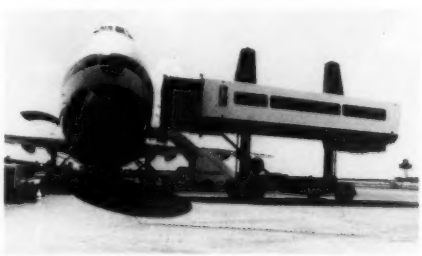
For copies of the Advisory Circular write DOT/FAA Distribution Unit, TAD 484.3, Washington, D.C. 20591, request AC 140-5.

## Quick Test Sharpens DF Equipment

Pilots will benefit from enhanced reliability in direction finding (DF) equipment (installed at many flight service stations and terminals) as the result of a "target transmitter" developed by FAA electronic technician Enoch L. Wright of Denver.

The new piece of test equipment provides a far simpler and less expensive means of ground check DF equipment than has been available previously. An eight ounce, self-contained unit replaces 50 pounds of equipment and 300 feet of extension cord. Operating on 0.1 watts, it produces a weak signal similar to that of an aircraft radio with the mike in the open position.

The new equipment will save the Government an estimated $40,000 annually.



***PLANE-MATE:*** New mobile loading lounges designed to "mate" with jumbo jetliners now in use at Dulles Airport at Washington, D.C. Lounges can carry 150 people, are raised and lowered on gigantic twin screw jacks to match aircraft floor heights up to 19 feet above ground level.

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. No anonymous letters will be used, but names will be withheld on request.

## • Down the Drain

I always enjoy your magazine and as a weather reconnaissance pilot I was deeply interested in the article "Where She Blows" (FAA AVIATION NEWS, July 1971). I have seen waterspouts far out in the Atlantic Ocean and, of course, we see them quite often around our home base in Puerto Rico.

However, you state "since most waterspouts in this hemisphere spin clockwise the trapped pilot should turn to his right." In the Northern Hemisphere I think waterspouts spin counterclockwise, as do hurricanes (and the water in the bathtub), due to the coriolis effect. I will still say a right turn is correct if you can control the aircraft.

Captain Robert Lee Clark, USAF
USAF Hurricane Hunters

*Right you are. Most waterspouts do spin counter-clockwise in the Northern Hemisphere, a fact which is further borne out by the photo in the article. Mike DeCapua, E. St. Louis, Ill., and W. T. Davis of Long Beach, Calif., also called our attention to our error in the text.*

*The right hand turn advice is correct.*

## • Shreveport Airspace

I enjoy FAA AVIATION NEWS very much and I have just reread "Legal but Unsafe" in the April 1971 issue. It is very interesting but articles like this do not help aviation if they are read by non-flying people who do not understand. I have flown through Shreveport and other places as you describe and there doesn't have to be an unsafe area for transient aircraft. Please tell the ladies how to fly legal and safe.

G. Barney Blair
Houston, Texas

*Our intention here was not to suggest in any way that the airspace over Shreveport was dangerous. A similar unsafe situation could have developed at any major terminal—Shreveport was chosen simply because it figured in an actual incident reported to us.*

*The message we hoped to convey is that observing weather minimums will not* ***in itself*** *assure you of a safe flight. We are sorry if this did not come through clearly.*

## • The Laird Swallow

I do not wish to detract from the many fine accomplishments of Lloyd Stearman, who gained his experience as an aircraft designer in my Wichita plant, but I must point out several serious errors in your article "The Yellow Peril" (FAA AVIATION NEWS, September 1970).

The statement, for example, that Lloyd Stearman "was offered a job as draftsman and mechanic at Matty Laird's struggling aircraft works in Wichita . . ." suggests that Stearman's arrival was responsible for the ultimate success of the Laird *Swallows;* whereas, in fact, the production line for this aircraft was well under way at the time of his employment as a mechanic at the E. M. Laird Company. I had produced scale drawings of this airplane in Chicago in 1919, prior to the organization of the E. M. Laird Company at Wichita, where in the production of the initial Laird *Swallow* I made full-scale drawings of the major assemblies.

Furthermore, the *New Swallow* associated with Mr. Stearman finished fourth and fifth (not first) in the 1924 Dayton Air Races (Event No. 2). The *New Swallow Special* that Walter Beech flew against Glenn Martin's entry was forced out of the race with radiator trouble after the second lap. My *New Laird-Commercial* completed all races entered, placing second in the 90 hp OX5 class. This same airplane placed fifth in the 150 to 160 hp class.

Mr. Stearman was and is a credit to the aviation industry, but in all fairness it should be stated that the success of my Wichita factory should be credited to many others on the team, such as Charles L. Laird, our superintendent, Walter Weber, Lester Bishop, William A. Burke, Walter Stroebel, William Snook, Jesse Chacon, Homer Clark and many others whose names I no longer recall.

E. M. (Matty) Laird
Lake Toxaway, N. C.

## • Lynched

Looking at the second to last paragraph on page 6 ("Weight Watching," FAA AVIATION NEWS April 1971), the last sentence reads, "He then adds up the total moment index, restores the reduction factor, and divides the total weight by the total moment, to derive the center of gravity location."

Shouldn't that be just the other way around? Shouldn't he divide the total moment by the total weight?

John D. Lynch
Honolulu

*We have been properly "lynched." You are quite right about our mistake. The correct procedure is given at the top of the column. Thank you for calling our attention to the error.*

## • Quiet, please

In the August 1971 issue of FAA AVIATION NEWS on page 7 you refer to the established noise abatement procedures on arrival and departure from Washington National. Where are these procedures published for Washington National and other airports around the country?

Robert E. Willow
Minnetonka, Minn.

*Detailed noise abatement procedures for Washington National Airport are published in the Airman's Information Manual, pages 4-42 of Part 4.*

*Actually, general noise abatement procedures in some form or another are in effect at all airports, through an Air Traffic Control order (71-10.13) issued in January 1968. This order outlines procedures for minimizing noise near airports and states that in order of importance to aviation development "noise abatement is placed second only to safety."*

*Information concerning procedures at specific airports can be obtained from any FAA Flight Service Station or FAA General Aviation District Office.*

## • Yea or Nay on TCA

Your August issue states on page 7 that "In 12 months of operating TCA's FAA has polled thousands of VFR pilots who have used Terminal Control Areas as to the problems or advantages associated with them."

We have had no reports of any such poll. To the contrary, we have had complaints from pilots who tried to get a VFR clearance (through TCA's) and were denied it, even though they had all the necessary equipment on board. We would appreciate some information on this "poll," how and where it was conducted, and what were the actual results.

Victor J. Kayne
Vice President, AOPA

*The word "polled" was used figuratively, and apparently misleadingly, in this connection. FAA field personnel have discussed usage of TCA's informally with as many private pilots as possible since the concept was first put into operation in order to have an accurate understanding of any problems associated with it. There has been no formal or written poll.*

*Clearances for VFR pilots through TCA's may be held up temporarily because of traffic saturation; however, properly equipped aircraft will be issued clearances on a "first-come, first-served" basis in accordance with safe traffic flow.*

## • The Face is Familiar

In the article "The Captain Speaking" (FAA AVIATION NEWS, September 1971) there is a picture of an attractive girl pilot sitting in the airplane talking on the radio. The face looks familiar. Do you have the name of the pilot?

Betty Andrews
Detroit, Mich.

*The pilot is Susan Oliver, movie and television actress and a distinguished real-life pilot. Susan holds numerous aviation records for international flight, is jet-qualified, and was co-pilot of the winning plane in the 1970 Powder Puff Derby. She was trying out the Washington TCA when the photo was taken.*

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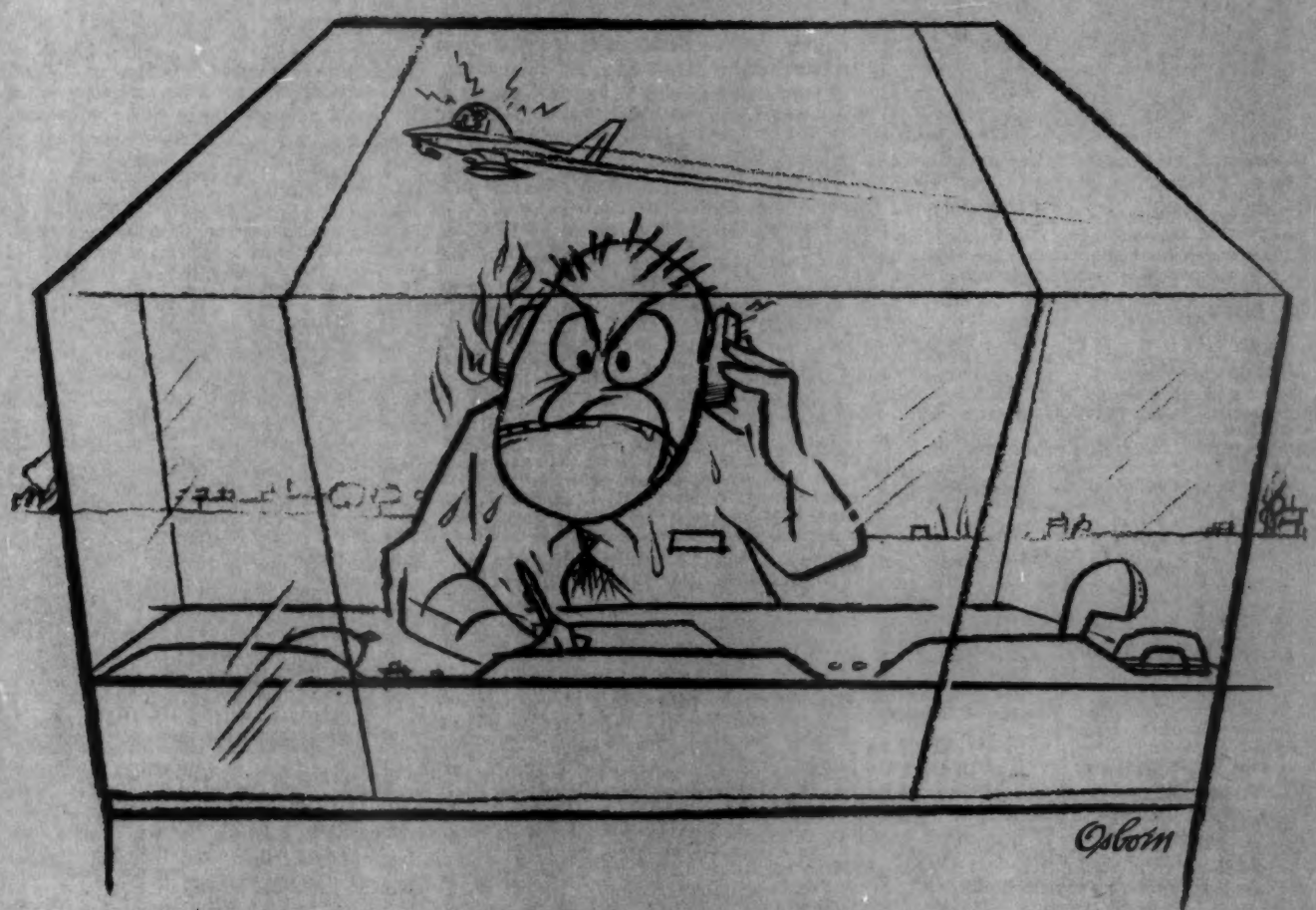


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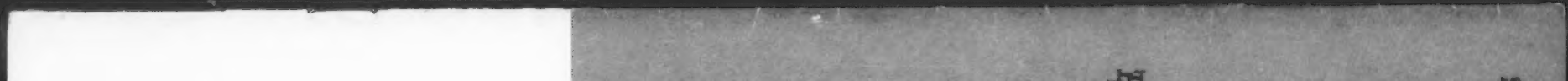
Suggested by Miss Terry L. Alexander
Imperial County FSS